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Parameter	Value	Unit
Initial temperature	25.0	°C
Final temperature	25.0	°C
Initial pressure	1.013	bar
Final pressure	1.013	bar
Initial volume	0.001	m³
Final volume	0.001	m³
Initial mass	0.001	kg
Final mass	0.001	kg
Initial density	1000	kg/m³
Final density	1000	kg/m³
Initial viscosity	0.001	Pa·s
Final viscosity	0.001	Pa·s
Initial thermal conductivity	0.6	W/m·K
Final thermal conductivity	0.6	W/m·K
Initial specific heat capacity	4182	J/kg·K
Final specific heat capacity	4182	J/kg·K
Initial enthalpy	4182	J/kg
Final enthalpy	4182	J/kg
Initial entropy	1.306	J/kg·K
Final entropy	1.306	J/kg·K
Initial internal energy	1674	J/kg
Final internal energy	1674	J/kg
Initial Gibbs free energy	-2371	J/kg
Final Gibbs free energy	-2371	J/kg
Initial Helmholtz free energy	-2371	J/kg
Final Helmholtz free energy	-2371	J/kg
Initial chemical potential	-2371	J/kg
Final chemical potential	-2371	J/kg
Initial activity	1.0	
Final activity	1.0	
Initial fugacity	1.013	bar
Final fugacity	1.013	bar
Initial vapor pressure	0.003	bar
Final vapor pressure	0.003	bar
Initial saturation temperature	100	°C
Final saturation temperature	100	°C
Initial boiling point	100	°C
Final boiling point	100	°C
Initial melting point	0	°C
Final melting point	0	°C
Initial freezing point	0	°C
Final freezing point	0	°C
Initial triple point	0.01	°C
Final triple point	0.01	°C
Initial critical temperature	374	°C
Final critical temperature	374	°C
Initial critical pressure	218	bar
Final critical pressure	218	bar
Initial critical density	322	kg/m³
Final critical density	322	kg/m³
Initial critical viscosity	0.055	Pa·s
Final critical viscosity	0.055	Pa·s
Initial critical thermal conductivity	0.12	W/m·K
Final critical thermal conductivity	0.12	W/m·K
Initial critical specific heat capacity	1980	J/kg·K
Final critical specific heat capacity	1980	J/kg·K
Initial critical enthalpy	2085	J/kg
Final critical enthalpy	2085	J/kg
Initial critical entropy	4.215	J/kg·K
Final critical entropy	4.215	J/kg·K
Initial critical internal energy	2085	J/kg
Final critical internal energy	2085	J/kg
Initial critical Gibbs free energy	-2371	J/kg
Final critical Gibbs free energy	-2371	J/kg
Initial critical Helmholtz free energy	-2371	J/kg
Final critical Helmholtz free energy	-2371	J/kg
Initial critical chemical potential	-2371	J/kg
Final critical chemical potential	-2371	J/kg
Initial critical activity	1.0	
Final critical activity	1.0	
Initial critical fugacity	218	bar
Final critical fugacity	218	bar
Initial critical vapor pressure	218	bar
Final critical vapor pressure	218	bar
Initial critical saturation temperature	374	°C
Final critical saturation temperature	374	°C
Initial critical boiling point	374	°C
Final critical boiling point	374	°C
Initial critical melting point	0	°C
Final critical melting point	0	°C
Initial critical freezing point	0	°C
Final critical freezing point	0	°C
Initial critical triple point	0.01	°C
Final critical triple point	0.01	°C

[illegible]

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JOAN PENNINGTON

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**METHOD AND APPARATUS FOR PROVIDING DYNAMIC ASSISTANCE
FOR DISABLED USER INTERFACE RESOURCES**

Field of the Invention

5 The present invention relates generally to the data processing field, and more particularly, relates to a method, computer program product and apparatus for providing dynamic assistance for disabled user interface resources.

Description of the Related Art

10 When designing and implementing a graphical user interface (GUI) that includes items in a list, context menus are usually provided which allow the user to perform various actions on the items in the list. In many instances, one or more of the menu items may need to be disabled for certain items in the list. In a list of User IDs, for example, the Delete action might be disabled for certain restricted system profiles. Current technologies
15 only allow the enabled or disabled states for menu items.

20 The reason a particular menu item is disabled may not be obvious or intuitive to the user of the GUI. This is especially true when multiple items have been selected and the menu item must be disabled due to restrictions that exist on one or more of the selected items. Following the previous example, the Delete option might be available when users, "Dunbar", "DeStefano", and "Rackham" are selected, but would be disabled when users, "Dunbar", "DeStefano", and "QSYS" are selected, since "QSYS" is a restricted profile.

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When a large list of items is selected, only one of those items can cause one or more menu actions to be disabled. It can be difficult and frustrating to figure out which item or items for which an action is not valid. Also, since menu items can be disabled for multiple reasons, it can be difficult for the user to determine why the action they wish to perform is not available.

Similarly, options and controls on property pages and wizard screens may need to be disabled for reasons not obvious to the user. Also, similarly some panels and pages must have all questions answered before they will perform their function. When all are not answered, current technology gives the user a message box with a "You must ... " message.

Also as GUI implementations evolve, the types of items included in existing list controls change and grow. When this occurs, GUI developers have to assess design tradeoffs to determine whether to either break apart and change the existing list containers, which may make it difficult for experienced users to navigate their new release, or to add the new items to existing list containers with additional context menu items. When the developer chooses to add the new items to existing list containers with additional context menu items, the occurrence of scenarios which cause menu items to be disabled can increase significantly, especially where multiple selection is allowed.

A need exists for a method, computer program product and apparatus for providing dynamic assistance for disabled user interface resources.

Summary of the Invention

A principal object of the present invention is to provide a method, computer program product and apparatus for providing dynamic assistance for disabled user interface resources. Other important objects of the present invention are to provide such method, computer program product and apparatus for providing dynamic assistance for disabled user interface resources substantially without negative effect and that overcome many of the disadvantages of prior art arrangements.

In brief, a method, computer program product and apparatus are provided for providing dynamic assistance for disabled user interface resources. Code for disabling controls is identified. A state of the identified control is changed from disabled to disabled with assistance. Assistance
5 text is provided to explain why control is disabled. Code is provided for correcting the condition for disabling control.

In accordance with features of the invention, an assistance icon is displayed for viewing by the user. Responsive to a user selection of the assistance icon, the assistance text is displayed. An adjustment button is
10 displayed. Responsive to a user selection of the adjustment button, the code for correcting the condition for disabling control is used, and an action is executed on eligible items.

Brief Description of the Drawings

The present invention together with the above and other objects and
15 advantages may best be understood from the following detailed description of the preferred embodiments of the invention illustrated in the drawings, wherein:

FIG. 1 is a block diagram representation illustrating a computer system for implementing methods for providing dynamic assistance for disabled user interface resources in accordance with the preferred
20 embodiment;

FIG. 2 is a diagram illustrating an exemplary graphical user interface (GUI) screen in accordance with the preferred embodiment;

FIG. 3 is a diagram illustrating another exemplary graphical user
25 interface (GUI) screen in accordance with the preferred embodiment;

FIGS. 4, 5, and 6 are flow charts illustrating exemplary sequential steps for providing dynamic assistance for disabled user interface resources in accordance with the preferred embodiment;

FIG. 7 is a block diagram illustrating a computer program product in

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accordance with the preferred embodiment.

Detailed Description of the Preferred Embodiments

Having reference now to the drawings, in FIG. 1, there is shown a computer or data processing system of the preferred embodiment generally designated by the reference character 100. As shown in FIG. 1, computer system 100 includes a central processor unit (CPU) 102, a display adapter 106 coupled to a display 108. CPU 102 is connected to a user interface (UI) adapter 110 connected to a pointer device and keyboard 112. CPU 102 is connected to an input/output (IO) adapter 114, for example, connected to a direct access storage device (DASD) 116 and a tape unit 118. CPU 102 is connected to a communications adapter 120 providing a communications network connection function with a network 122. The computer system 100 includes a memory 130 storing a graphical user interface (GUI) user dynamic assistance program 132 of the preferred embodiment.

Central processor unit 102 is suitably programmed to execute the flow charts of FIGS. 4, 5, and 6 of the preferred embodiment and for generating a graphical user interface (GUI) screen, such as illustrated and described with respect to FIGS. 2 and 3. Computer 100 may be implemented using any suitable computer, such as an IBM personal computer running the OS/2® operating system.

In accordance with features of the preferred embodiment, a new menu item state, disabled with assistance is provided. This new menu item state disabled with assistance enables GUI designers to create programs that solve design and usage problems otherwise resulting from disabled states in a more intuitive and natural way. When a menu item is changed to disabled with assistance state, the menu item is displayed in a visually distinct manner, such as "grayed out", and accompanied by a distinct audible tone. Just as the current disabled state, it would not be selectable. However, the disabled with assistance menu item has also a live zone added to the end of the menu item. When a user selects this live zone, additional information is displayed that explains to the user why the menu item or control was disabled.

In accordance with features of the preferred embodiment, additionally the GUI designer/developer can provide an adjustment button at the end of the explanation text that change the user's selections so that the menu item becomes enabled and optionally performs the associated action on the remaining selected items. In some applications menu items would be "grayed out" because of options selected or decisions made earlier in a multi-step task. In these instances, the GUI designer/developer can provide, instead of an adjustment button, a "where did I go wrong?" button that would take the user to the menu or page where the decision was made and visually highlight the controls with the selections responsible for the disabling. Similarly, the GUI designer/developer can provide a "what did I leave out?" button on the "You must ..." message box. Pressing this "what did I leave out?" button positions the unanswered question or questions in the viewable window and visually highlights them.

With a disabled with assistance state, the specific reason a menu item was disabled is displayed, making it easy for the user to determine how to proceed. The adjustment button also simplifies the user's task, especially in situations when the user has inadvertently selected items that are restricted from certain actions. When a menu item is disabled, the GUI developer has already written code to determine when the menu item needs to be disabled. It is therefore relatively easy to retrofit existing code to take advantage of the disabled with assistance state. Also the disabled with assistance state gives the GUI developer an option that eases the transition to a new release for an experienced user, without creating confusion for a new user as GUI implementation evolve.

Referring now to FIG. 2, there is shown an exemplary graphical user interface (GUI) screen in accordance with the preferred embodiment generally designated by the reference character 200. A disabled with assistance state 202 is shown with a send menu item. Also a disabled state 204 is shown with a delete menu item. As shown in FIG. 2, a distinguishing circular icon is provided with the disabled with assistance menu item 202.

Referring now to FIG. 3, there is shown another exemplary graphical user interface (GUI) screen in accordance with the preferred embodiment generally designated by the reference character 300. The disabled with

assistance state 202 and the disabled state 204 are shown. A user selects or moves the cursor over the disabled with assistance state identifier and an explanation text 302 is displayed. Explanation text 302 tells the user precisely why the particular action was disabled. As shown in FIG. 3, the explanation text 302 indicates that two selected users QBRMS and QDFTOWN cannot be sent. An adjustment button 304 is shown following the explanation text 302. As shown in FIG. 3, the adjustment button 304 indicates send the rest. A user selection of adjustment button 304 changes the user's selections so that the menu item becomes enabled and performs the associated send action on the remaining selected items.

Referring now to FIG. 4, there are shown exemplary sequential steps for enabling existing code to use the new disabled with assistance state 204 of the user interface resources in accordance with the preferred embodiment starting at a block 400. First existing code that disables controls is found as indicated in a block 402. Checking whether assistance is needed is performed as indicated in a decision block 404. If assistance is not needed, this completes the sequential steps. When assistance is needed, the state is changed from disabled to disabled with assistance as indicated in a block 406. Next text is added that explains why control is disabled as indicated in a block 408. Checking whether adjustment is needed is performed as indicated in a decision block 410. If adjustment is not needed, this completes the sequential steps. When adjustment is needed, code is added that corrects the condition that disabled the control, for example typically this involves removing some of the selections, and then the existing handler code is called as indicated in a block 412.

Referring now to FIG. 5, there are shown exemplary sequential steps for user handling a disabled control in accordance with the preferred embodiment. A user selects multiple items in a list as indicated in a block 502. The user right clicks on selected items to bring up a context menu of available actions as indicated in a block 504. Checking whether the desired action is disabled is performed as indicated in a decision block 506. If the desired action is not disabled, then the action is executed as indicated in a block 508 and the sequential steps end. Otherwise when the desired action is disabled, the user attempts to determine why the action is disabled as indicated in a block 510. Checking whether there is help text that describes

why the action is disabled is performed as indicated in a decision block 512. Many possible causes may be listed for each of the available actions. When help text is available, the user tries to unselect the items that caused the action to be disabled as indicated in a block 514. Then the sequential steps return to block 504 where the user again right clicks on selected items to bring up a context menu of available actions. When help text is not available, the user can randomly try unselecting items or the user can select one item at a time and try to execute the action as indicated in a block 516. Then the sequential steps return to block 504 where the user again right clicks on selected items to bring up a context menu of available actions.

Referring now to FIG. 6, there are shown exemplary sequential steps for user handling a disabled with assistance control in accordance with the preferred embodiment. A user selects multiple items in a list as indicated in a block 602. The user right clicks on selected items to bring up a context menu of available actions as indicated in a block 604. Checking whether the desired action is disabled is performed as indicated in a decision block 606. If the desired action is not disabled, then the action is executed as indicated in a block 608 and the sequential steps end. Otherwise when the desired action is disabled, checking whether there is an assistance icon is performed as indicated in a decision block 610. When no assistance icon is available, then the sequential steps starting at block 510 in FIG. 5 following entry point A are performed. When an assistance icon is available, the user selects or flies the cursor over the assistance identifier, then assistance text is displayed which tells the user exactly why this action was disabled as indicated in a block 612. Checking whether there is an adjustment button is performed as indicated in a decision block 614. When no adjustment button is available, the user adjusts the selections as indicated in a block 616. Then the sequential steps return to block 604 where the user again right clicks on selected items to bring up a context menu of available actions. When an adjustment button is available, the user pushes the adjustment button and the action is executed on the eligible items as indicated in a block 618 and the sequential steps end.

Referring now to FIG. 7, an article of manufacture or a computer program product 700 of the invention is illustrated. The computer program product 700 includes a recording medium 702, such as, a floppy disk, a high

capacity read only memory in the form of an optically read compact disk or CD-ROM, a tape, a transmission type media such as a digital or analog communications link, or a similar computer program product. Recording medium 702 stores program means 704, 706, 708, 710 on the medium 702
5 for carrying out the methods for providing dynamic assistance for disabled user interface resources of the preferred embodiment in the system 100 of FIG. 1.

A sequence of program instructions or a logical assembly of one or more interrelated modules defined by the recorded program means 704,
10 706, 708, 710, direct the computer system 100 for providing dynamic assistance for disabled user interface resources of the preferred embodiment.

While the present invention has been described with reference to the details of the embodiments of the invention shown in the drawing, these
15 details are not intended to limit the scope of the invention as claimed in the appended claims.

Claims

What is claimed is:

- 1 1. A method for providing dynamic assistance for disabled user
2 interface resources comprising the steps:
3 identifying code for disabling controls;
4 changing a state of identified code from disabled to disabled with
5 assistance;
6 providing assistance text to explain why control is disabled; and
7 providing code for correcting a condition for disabling control.
- 1 2. A method for providing dynamic assistance for disabled user
2 interface resources as recited in claim 1 includes the step of displaying an
3 assistance icon for viewing by a user.
- 1 3. A method for providing dynamic assistance for disabled user
2 interface resources as recited in claim 2 includes the steps of identifying a
3 user selection of said assistance icon and displaying said assistance text.
- 1 4. A method for providing dynamic assistance for disabled user
2 interface resources as recited in claim 3 includes the step of displaying an
3 adjustment button.
- 1 5. A method for providing dynamic assistance for disabled user
2 interface resources as recited in claim 4 includes the steps of identifying a
3 user selection of said adjustment button; and utilizing said code for
4 correcting condition for disabling control, and executing an action on eligible
5 items.
- 1 6. A method for providing dynamic assistance for disabled user
2 interface resources as recited in claim 1 includes the step of displaying a
3 help text for viewing by a user.

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1 7. A method for providing dynamic assistance for disabled user
2 interface resources as recited in claim 1 wherein said step of changing said
3 state of identified code from disabled to disabled with assistance includes
4 the step of providing an assistance icon with said identified code, said
5 assistance icon for viewing by a user in a context menu of available actions
6 for user selected items.

1 8. A computer system having apparatus for providing dynamic
2 assistance for disabled user interface resources comprising:
3 a processor,
4 a memory;
5 a display;
6 a bus connecting said processor, said memory and said display,
7 a GUI dynamic assistance program, a graphical user interface
8 including a disabled with assistance menu item; said GUI dynamic
9 assistance program performing the steps of:
10 identifying code for disabling controls;
11 changing a state of identified code from disabled to disabled with
12 assistance;
13 providing assistance text to explain why control is disabled;
14 providing code for correcting a condition for disabling control;
15 displaying an assistance icon for viewing by a user;
16 identifying a user selection of said assistance icon; and
17 displaying said assistance text and displaying an adjustment button.

1 9. A computer program product for implementing dynamic
2 assistance for disabled user interface resources, said computer program
3 product including a plurality of computer executable instructions stored on a
4 computer readable medium, wherein said instructions, when executed by
5 said computer, cause the computer to perform the steps of:
6 identifying code for disabling controls;
7 changing a state of identified code from disabled to disabled with
8 assistance;
9 providing assistance text to explain why control is disabled; and
10 providing code for correcting a condition for disabling control.

1 12. A computer program product for implementing dynamic
2 assistance for disabled user interface resources as recited in claim 9 further
3 includes the steps of displaying an adjustment button; identifying a user
4 selection of said adjustment button; and utilizing said code for correcting
5 said condition for disabling control, and executing an action on eligible items.

Abstract of the Disclosure

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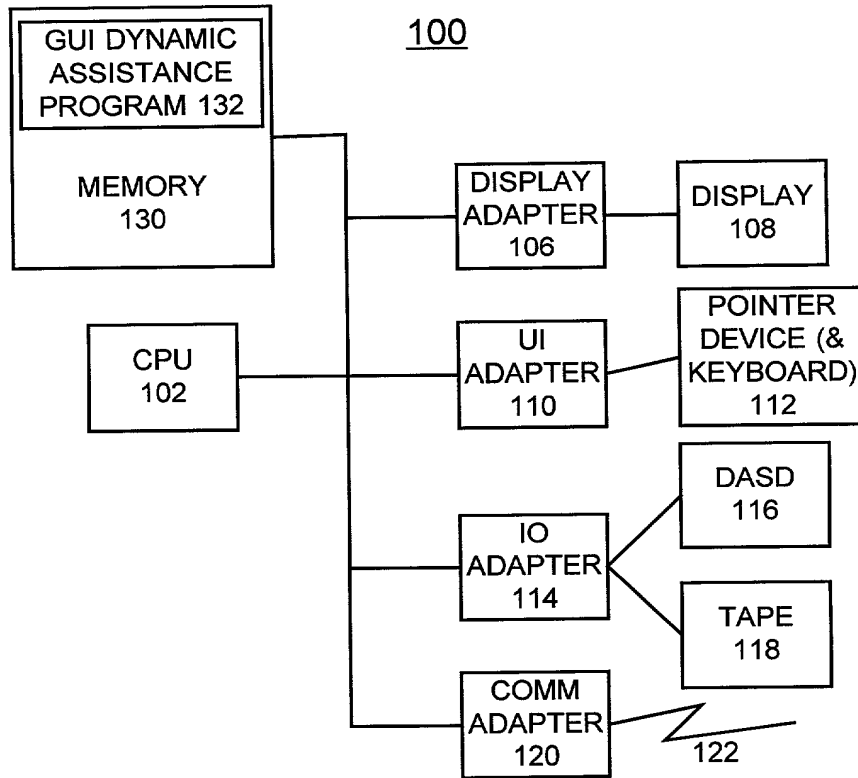


FIG. 1

200

DISABLED WITH ASSISTANCE 202

FIG. 2

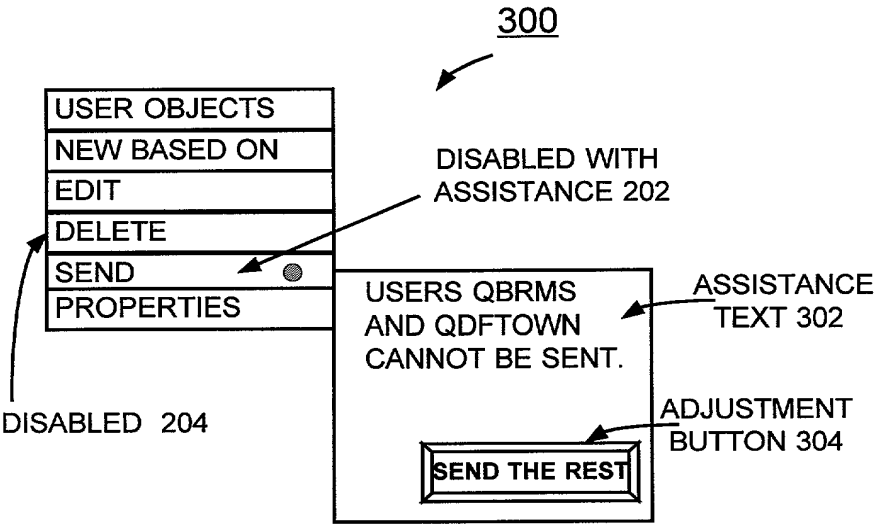


FIG. 3

FIG. 4

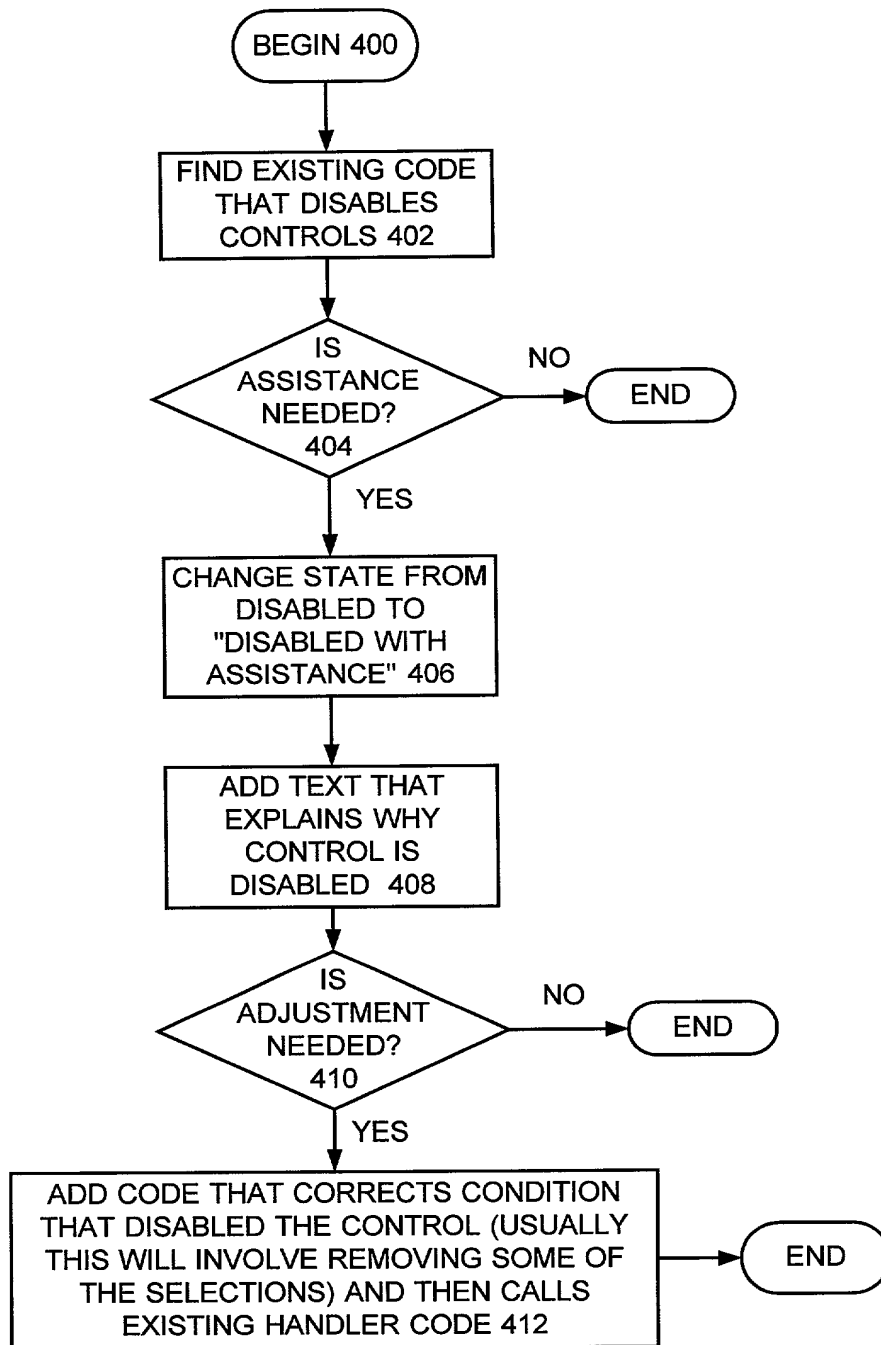
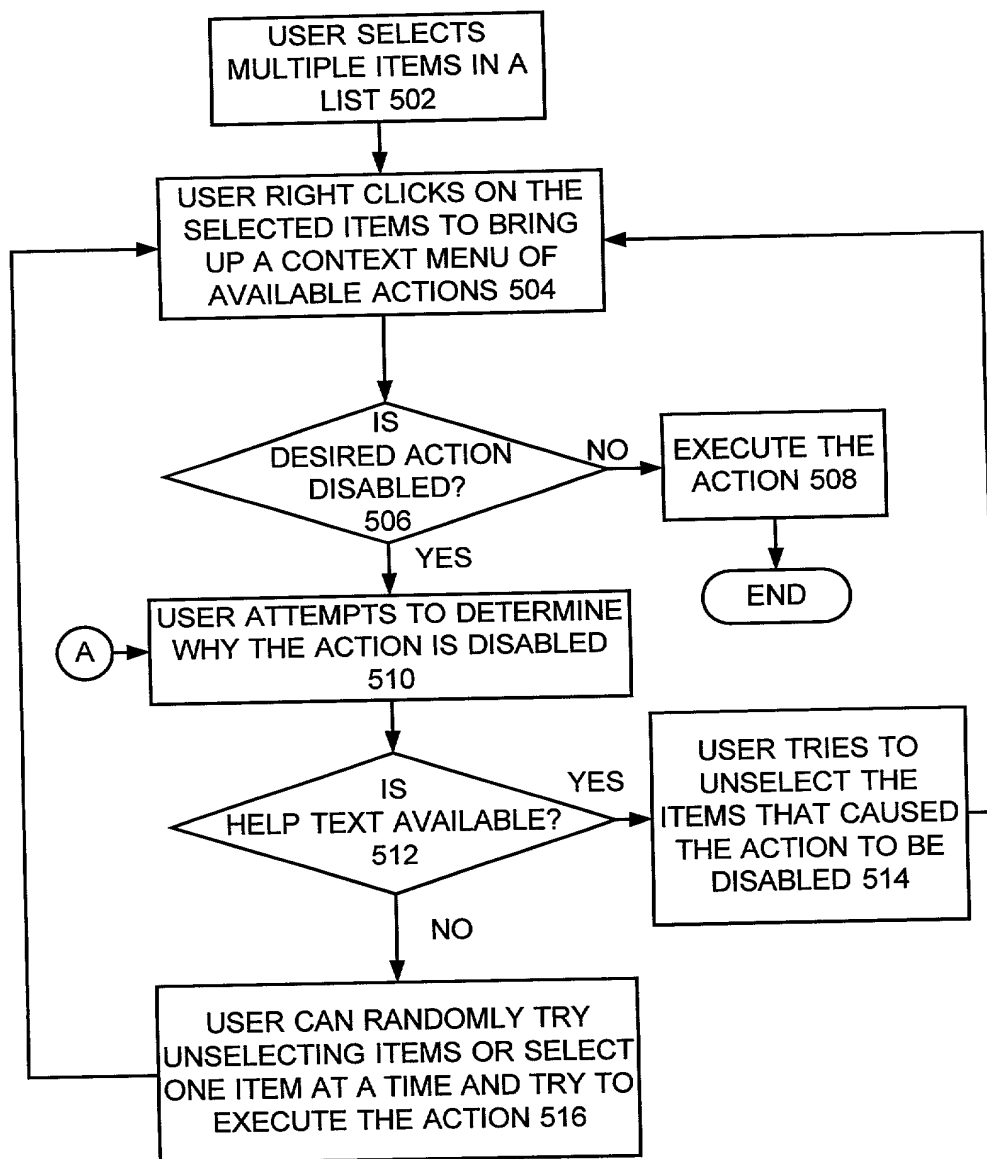


FIG. 5



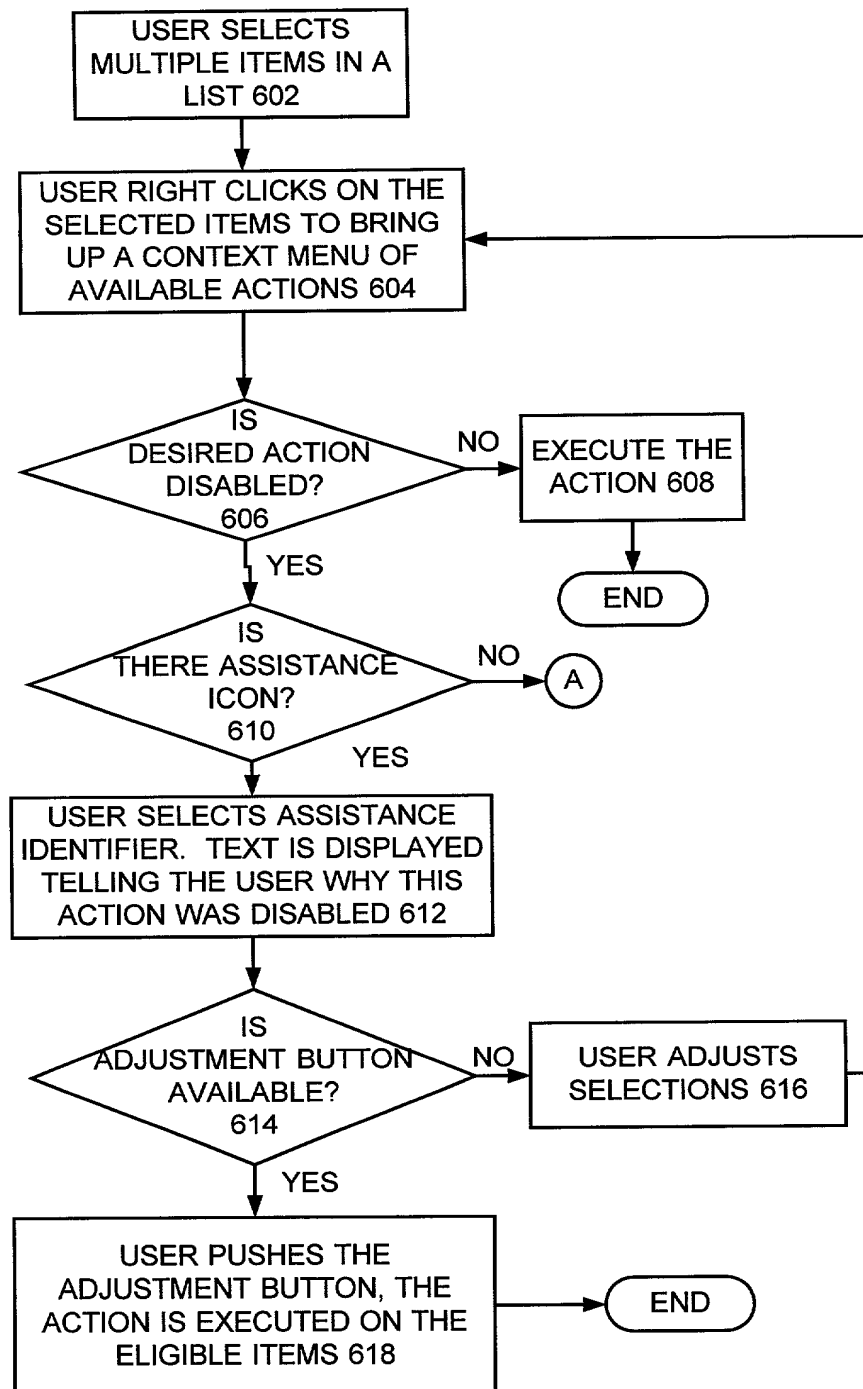
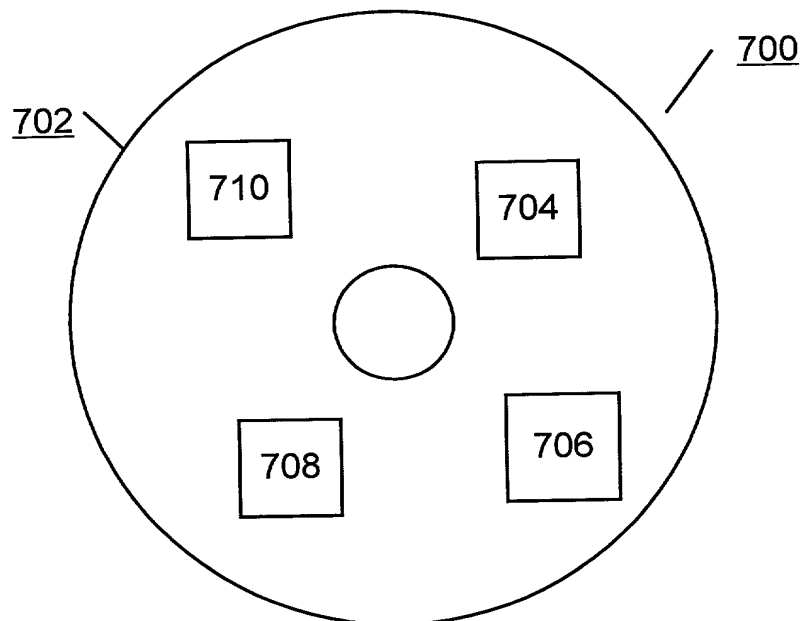


FIG. 7



DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD AND APPARATUS FOR PROVIDING DYNAMIC ASSISTANCE FOR DISABLED

USER INTERFACE RESOURCES

the specification of which (check one)

☒ is attached hereto.
☐ was filed on _____ as
 Application Serial No. _____
 and was amended on _____
 (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulation, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

(NONE) _____ YES NO
 (Number) (Country) (Day/Month/Year Filed)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States Application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the

_____ This declaration ends with this page. ☒ Signature for 2nd and subsequent inventors. # pages added 2

prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information material to the patentability of this application as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT International filing date of this application:

(NONE)

 (Application Serial No.) (Filing Date) (Status) (Patented, Pending, Abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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